

Table 2. Problems at the stage of constructing the system versus problems connected with its functioning – their sources

No	Question	Answers	Results %			
			A	B	C	D
1	Which main problems did the organization have to confront at the stage of constructing the system before the first certification?	a. none	3.1	4.5	3.5	1.0
		b. interpretation of standard requirements	21.8	22.7	22.0	23.2
		c. elaboration of documentation	27.5	26.1	28.0	30.3
		d. employees reluctance	19.9	21.8	18.9	22.2
		e. commitment on the side of top management	4.8	4.7	6.6	8.0
		f. process approach	10.0	8.1	7.3	7.6
		g. difficulties at constructing the system composed of many elements	10.7	9.0	10.5	6.6
		h. others, state which	2.2	3.1	3.2	1.1
		20.9	19.1	18.2	30.9	
2	What sort of problems associated with system functioning have you been confronted with recently?	a. system documentation	8.0	11.0	11.4	9.9
		b. internal audits	15.8	15.3	13.6	10.5
		c. monitoring of processes	6.0	7.5	9.8	7.9
		d. management review	12.0	9.5	7.2	9.2
		e. system planning	31.8	32.4	34.3	25.0
		f. system improvement	5.5	5.2	5.5	6.6
		g. others, state which	8.9	10.6	10.5	12.8
3	What, in your opinion, are the main causes for the problems to occur?	a. poor commitment of top management	14.4	7.9	8.4	12.2
		b. wrong decisions at the stage of system constructing	18.5	16.9	22.6	20.4
		c. poor training of the employees who operate the system	7.0	10.1	13.4	9.9
		d. inadequate resources allocated for system functioning	14.6	13.8	10.9	16.9
		e. lack of coordination between different elements of the system	32.4	36.0	27.6	23.3
		f. lack of time	4.2	4.7	6.6	4.5
		g. others, state which				

Source: the author

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QUALITY MANAGEMENT OF THE SUPPLIES FOR THE FIRST ASSEMBLY IN AUTOMOTIVE INDUSTRY – RESEARCHES RESULTS

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The hereby article is a presentation of the researches results concerning the importance of Quality Management System requirements in automotive industry regarding the supplies for the first assembly. For that purpose versatile researches were conducted including the car manufacturers and the clients of the automotive industry. The results should be important to the potential suppliers for the first assembly, but also the companies which are expanding their position in automotive industry. Car, parts and accessories market is highly competitive, which influences the requirements that need to be met by the suppliers in automotive industry. The common practice for remaining and developing in automotive industry is the certification of the quality management system in accordance with ISO/TS 16949:2002 standard. The researches show that ISO/TS 16949:2002 requirements are only a part of the whole set of requirements in the automotive industry, which are very diverse and are not the most important ones. The most known requirements for the first assembly suppliers in automotive industry are:

- standards for Quality Management System certification- above all ISO/TS 16949:2002(but also VDA 6.1 and others),
- legal requirements, regarding the human rights, environmental management and environment protection, patent laws,
- rules for conducting audits of the manufacturing and product process, required by ISO/TS 16949:2002, but described in VDA 6.3. and VDA 6.5,
- main tools in automotive industry systems- described in QS-9000- advanced quality planning (APQP), production details approval (PPAP), statistical process control, measurement system analysis (MSA), failure mode and effects analysis(FMEA),
- ISO/TS 16949:2002 requirements interpretations and rules for certification defined by IATF (International Automotive Task Force),
- and finally the CSR (Customer Specific Requirements)

The author in his work made a hypothesis concerning the importance of requirements, which should be the foundation of suppliers quality management system in automotive industry. The results of the researches are conducted to its verification and creating the ranking of quality management system criteria.

Introduction

Among all of the automotive industry suppliers we can point out those companies that are only functioning in that branch and are OE/ OES² and AM³ suppliers. Wix, Visteon, Lear, Delphi, Fastek Fitting are one of them, but more often we can find companies there weren't connected with the automotive industry at the beginning. Regarding the sales revenues, AM supplies are multiplicity of the OE/OES, but OE/ OES are the essential for model organizational solutions, work environment, infrastructure and most of all a passage to supplier's further development. Obtaining OE/ OES supplier status in automotive industry is a great challenge for many companies that are unable to fulfill the requirements even though they are successful in other markets. It's crucial also, that the commonly articulated requirement for potential suppliers- certified, branch management system- isn't enough for obtaining original equipment supplier status. Right architecture of Quality Management System is the basic requirements for obtaining and maintaining OE/ OES supplier status. In reality universal standards (ISO 9001:2000) and branch standards (ISO/ TS 16949:2002)⁴ do not supply sufficient requirements in

² OE/OES – original equipment/ original equipment services.

³ AM – after market

⁴ J. Łańcucki (red.), Podstawy zarządzania jakością w przedsiębiorstwie. TQM, Wydawnictwo AE w Poznaniu, 2003,

that scope².

Characteristic of the conducted researches

The main objective of the researches was to determine the elements of the OE/ OES suppliers quality management system and to assess their relevance. During the 2004-2005 five researches were conducted to obtain wide spectrum of opinions.

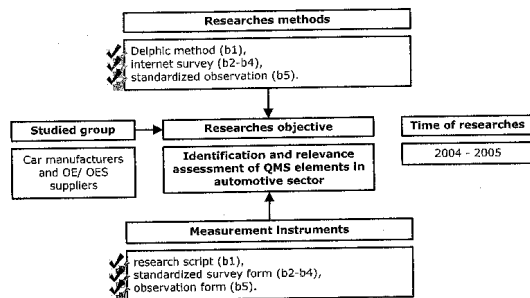


Fig. 1 Characteristics of made research - chosen elements
Legend: b1, b2, b3, b4, b5 - sequence of conducted researches
Source: own elaboration

First research was conducted to identify elements of QMS by the experts, with the usage of 'Delphic method'. Eight experts in quality management in automotive industry, amongst OE/ OES suppliers was invited to participate in the research. That kind of selection should guarantee the right perceiving of system requirements, considering direct cooperation with the car manufacturers and AM suppliers. The research was conducted based on the prepared script. According to the author restrictions connected with the group surveys were effectively eliminated. Professional knowledge of the moderator allowed to manage the research in a proper way and eliminate radical opinions which were sometimes stated. They were dictated by accumulation of the suppliers' problems in specific aspects of quality management³. As a result of the research list of key QMS elements in experts opinions was created. Additionally it was arranged in categories and subcategories⁴. Finally list of system elements, which aren't included in ISO/ TS 16949 standard, but are also crucial for maintaining and improving QMS was created. Group of experts discussed also the adequacy of 5 point scale and the assessment of the specific QMS elements. We can find elements of the case study method in the first research⁵ and also in the fifth one. It is crucial to point out the type of the case study and direct relation with the standardized management systems requirements while defining the key elements in quality management system for automotive sector.

s. 124-139.

³ Patrz. J. Łuczak, T. Bramorski, QS-9000 System zarządzania jakością na rynku motoryzacyjnym, Quality Progress, 1999, s. 64-71.

⁴ For example, one of the respondents pointed out the critical meaning of cleanliness in the company, which was dictated by the negligence in that area, which was pointed out by the clients during their audits.

⁵ ISO/ TS 16949: 2002 established by ISO and TTA technical committee was used as a basis of the brainstorming method.

⁶ Case study - it is not a research method itself, but it contains elements of various methods such as, multistage observation connected with surveys and analysis of the return data. Although many authors consider case study as a method of quality researches, thanks to its reconnaissance character and usefulness in the first stages of researches (D.A. Aaker, V. Kumman, G.S. Day Marketing Research, John Wiley & Sons, New York, 1995, p. 187).

The fifth research was conducted as a standardized observation with the usage of observation form, during eleven certification audits, recertification (ISO/ TS 16949:2002) and foremost QMS clients audits regarding their present and potential suppliers. The author was participating in the audits as an observer by the common accord of both sides.

Researches number 2, 3 and 4 were conducted to assess the relevance of OE/ OES suppliers quality management system, with the participation of:

- passenger cars and trucks manufacturers (signatories of the QS-9000)
- global suppliers (common suppliers for 'The Big Three')
- suppliers with the certificated ISO/ TS 16949:2002 system, located in Poland.

Especially thanks to those researches, wide spectrum of requirements that need to be met by the OE/ OES suppliers were defined. Internet survey form was used to conduct those researches. Measurement of quality characteristics variability and Kendall's concordance coefficient were used for assuring the researches creditability and verification of the experts assessment⁶.

Researches results (chosen issues) and conclusions

Work objectives and hypothesis were verified positively thanks to the conducted researches, during which:

- elements of OE/ OES suppliers quality management system in automotive sector were identify (research 1)
- relevance assessment of the OE/ OES suppliers quality management system elements (researches 1, 2, 3, 4, 5)

During the identification of QMS elements changes were made in ISO/ TS 16949:2002 primary structure, herein adding a new category of elements. Those are new genre elements, but also concrete tools - very specific for automotive sector:

- information security (confidentiality, accessibility, integrity),
- PPAP - production part approval process,
- APQP - advanced quality production planning,
- Benchmarking,
- assuring the correlation between FMEA results and control plans
- configuration management
- team work (methods and techniques of problem solving and continua improvement)
- risk management
- costs of quality
- 8D,
- 5S.

Analysis of the QMS elements categories relevance shows the importance of specific elements - often specific solutions in the scope of suppliers quality management. Category named as "Others" turned out to be more important than "Quality Management System" category. Direct verification of the hypothesis is connected with the results concerning the relevance of quality management system elements such as PPAP and APQP. Results were compiled on the basis of experts opinions, but with the correlation with other researches results, as figure 3 shows.

Conducted analysis of the QMS elements relevance, without taking categories and subcategories into consideration, showed the importance of typical elements from other categories, not included in "Other" category. That is why additional factor analysis was conducted to point out hidden connections between specific elements.

⁶ Patrz m.in. E. Nowak (red.), Prognozowanie gospodarcze, Agencja Wydawnicza Płacet, Warszawa, 1998, ss. 204-209.

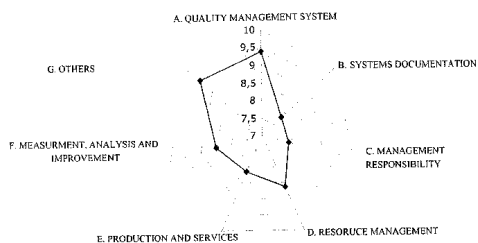


Figure 2. Importance of category – set of QMS elements of OE/OES suppliers from automotive industry (according to averages)
Źródło: Own elaboration, according to the 1st research results

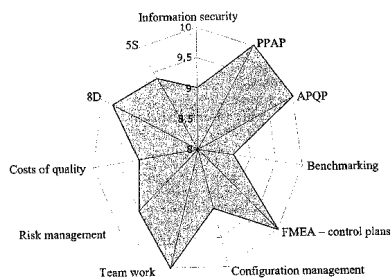


Figure 3. Importance of QMS elements (within the confines of dominant category „Others”) of OE/OES suppliers in automotive industry (according to averages)
Źródło: Own elaboration, according to the 1st research results

Summary

Researches results supply important information both for companies that are functioning in automotive sector supplying the products for OE/OES management for years and for those who are planning to join the automotive sector. The first group can verify its actual concept of the quality management system, using their cooperation with specific clients. The researches verified the common opinion about the necessity of implementing and certifying quality management system in order to apply for the OE/OES supplier status. In reality it isn't enough despite the declarations of automotive sector clients and imposing such requirements.

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